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Superfund Enforcement Decision Document (EPA Region 4): Lees Lane Landfill Louisville, Kentucky

(U.S.) Environmental Protection Agency
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EPA

Superfund Enforcement Decision Document:

Lees Lane Landfill, KY

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Lees Lane Landfill (LLL) site is located adjacent to the Ohio River in Jefferson County, Kentucky. Land use at the site has included a sand and gravel quarry, a junkyard, and a landfill. The landfilling operations were reported to have begun in the late 1940s. The site received domestic, commercial, solid municipal, and at least 212,400 tons of mixed industrial waste (some drummed) prior to its closure in April 1975. In March 1975, homeowners in an adjacent community, reported flash fires around their water heaters. A subsequent investigation detected explosive levels of methane gas and seven families were evacuated from homes near the site. A venting system was installed in October 1980. In February 1980, the Kentucky Department of Hazardous Materials and Waste Management (HMWM) discovered approximately 400 drums about one hundred feet from the Ohio River bank. The drums were moved to an approved hazardous waste disposal facility by the LLL owners under court order in September and October 1981. The remaining nonhazardous drummed materials and empty drums were buried onsite. Surface water, soil, and ground water are contaminated with benzene, heavy metals including lead, arsenic, and chromium, and inorganics.

The selected remedy for this site includes: provision for a properly operating gas collection system; consideration of a possible future alternate water supply; cleanup of surface waste area which will involve removal of exposed drums, capping of "hot spot"

(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Enforcement Decision Document Lees Lane Landfill, KY (Second Remedial Action) Contaminated Media: soil, gw, sw Key contaminants: VOCs, inorganics, heavy metals, chromium		

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16. ABSTRACT (continued)

soils and an area containing exposed trash, and disposal at an approved landfill; bank protection controls which will include the installation of riprap to minimize erosion potential and failure of the Ohio River embankment; estalishment of an ACL for the ground water at the site; institutional controls, which will be fully identified during remedial design; and ground water, gas, and air monitoring. The estimated capital cost for this remedy is $2,343,000 with annual O&M costs of $127,440.

ENFORCEMENT DECISION DOCUMENT
REMEDIAL ALTERNATIVE SELECTION

SITE

Lees Lane Landfill
Louisville, Kentucky

DOCUMENTS REVIEWED

I am basing my decision primarily on the following documents and recommendations describing the analysis of the cost and effectiveness of the remedial alternatives for the Lees Lane Landfill site.

- Remedial Action Master Plan for the Lees Lane Landfill, May 1983
- Remedial Investigation for the Lees Lane Landfill, April 1986
- Feasibility Study for the Lees Lane Landfill, April 1986
- Responsiveness Summary
- Recommendations from the State of Kentucky
- Staff recommendations

DESCRIPTION OF SELECTED REMEDY

The selected remedy includes:

- Provision for a properly operating gas collection system
- Consideration of a possible future alternate water supply
- Cleanup of surface waste area
- Bank protection controls
- Establishment of an ACL for the groundwater at the site
- Institutional controls, which will be fully identified during remedial design, will be implemented. These controls may include, but will not be limited to.
    - cautionary signs,
    - installation of a gate at the Putnam Street access point.
- Operation and Maintenance (O&M) activities which will include:
    - groundwater, gas, and air monitoring,
    - inspection of the gas monitoring wells, gas collection system, capped waste areas, and the riprap along the Ohio River bank.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the remedy described above for the Lees Lane Landfill site is a cost-effective remedy that provides adequate protection of public health, welfare and the environment. The State of

Kentucky has been consulted and agrees with the remedy. The PRPs and EPA have agreed in principle that the PRPs will perform the selected remedy. The terms of an Administrative Consent Order, possibly including reimbursement for past costs, is in the process of completion.

I have also determined that the action being taken is a cost-effective alternative when compared to the other remedial options reviewed.

SEP 25 1986

Date

Jack E. Ravan
Regional Administrator

Enforcement Decision Document
Remedial Alternative Selection
Lees Lane Landfill Site
Louisville, Kentucky

SITE LOCATION AND DESCRIPTION

The Lees Lane Landfill site is located adjacent to the Ohio River in Jefferson County, approximately 4.5 miles southwest of Louisville, Kentucky. The site, consisting of 112 acres, is approximately 5,000 feet in length and 1,500 feet in width (see Figure 1). The site consists of three tracts of land designated as the northern, central, and southern tracts. Most of the landfill site is level to gently sloping, with one depression having steep slopes located on the southern end of the site. The landfill surface is primarily covered with well established vegetation ranging from brush to woodlands. During the Remedial Investigation (RI) Scattered drums, construction debris, tires, and household wastes were observed on the landfill surface. The site lies within the 100-year floodplain of the Ohio River. Therefore, if a major flood occurred it could cover 25 to 50 percent of the landfill causing two potential effects to the site: disturbance of the surface cover by the floodwaters and gradual erosion of the western bank of the landfill.

The site is bordered on the east and south by a flood protection levee. To the northeast is Borden, Inc., a chemical manufacturer, and to the south is the Louisville Gas and Electric Cane Run Plant (a coal-burning electric generating station). Other industrial development occupies some of the Kentucky side of the Ohio River from Louisville south to the Lees Lane Landfill area. Across the levee to the east of the site is Riverside Gardens, a residential development of about 330 homes and 1,100 people. The west side of the site has a narrow, terraced area which serves as a buffer zone between the landfill and the Ohio River. A gas collection system has been installed along the property boundary southeast of the site between the landfill and Riverside Gardens (see Figure 2).

The geology of the site area consists of approximately 110 feet of Ohio River alluvium and glacial outwash underlain by the New Albany shale, reported to be 100 feet thick. The alluvial aquifer is unconfined with the shale forming an aquitard between the alluvial aquifer and the deeper limestone aquifers. Both the alluvial and limestone aquifers are current and potential sources of drinking water. The water table begins approximately 50 feet below land surface and the saturated thickness of the alluvial aquifer is approximately 60 feet. The groundwater flow direction at the site is predominantly toward the Ohio River with a potential for groundwater flow under the river. During periods of high flow in the Ohio River, contaminant migration may reverse. However, in order for groundwater flow reversal to reach Riverside Gardens, the conditions necessary for flow reversal would have to be present for a long period of time.

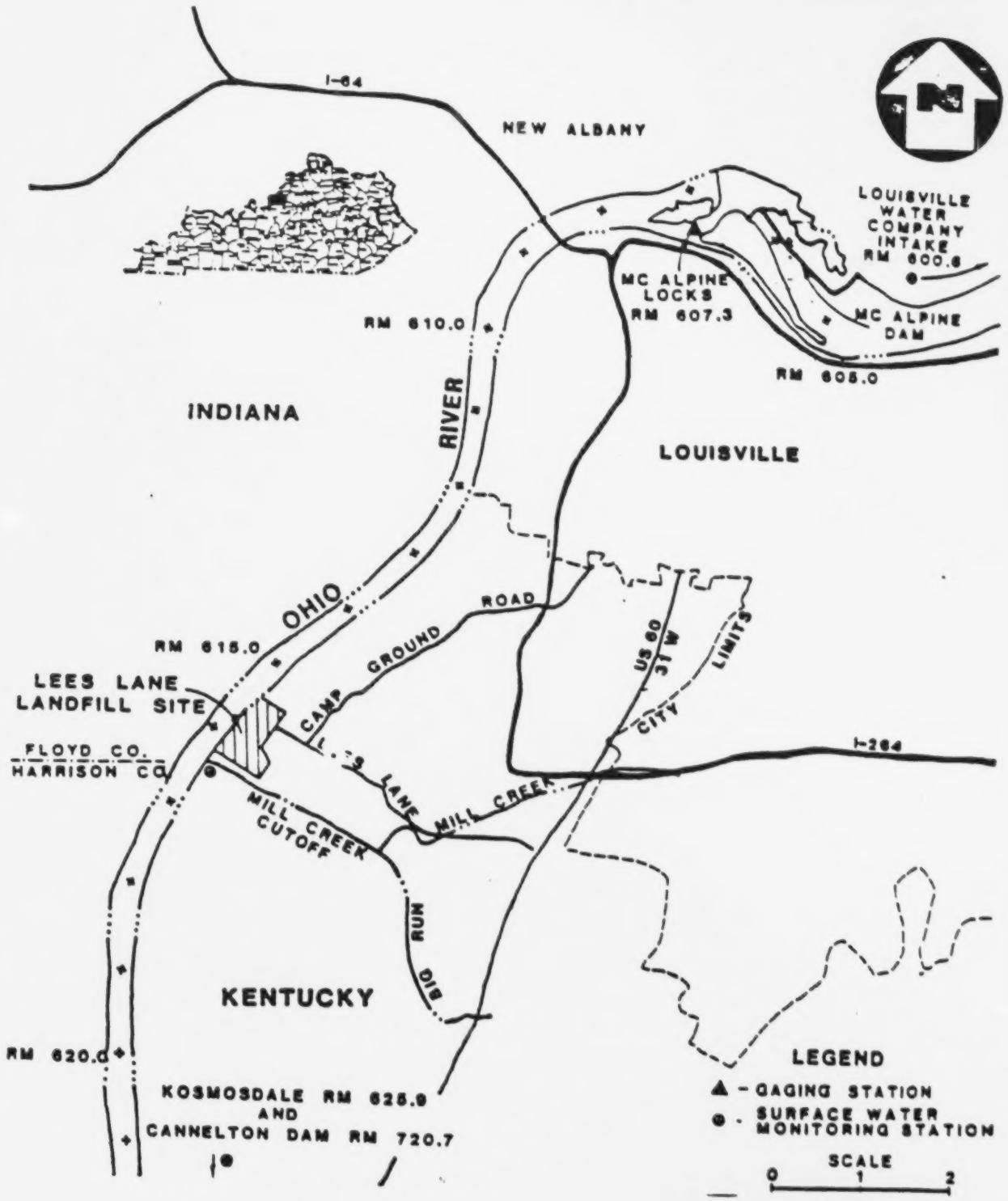


FIGURE 1
REGIONAL MAP
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

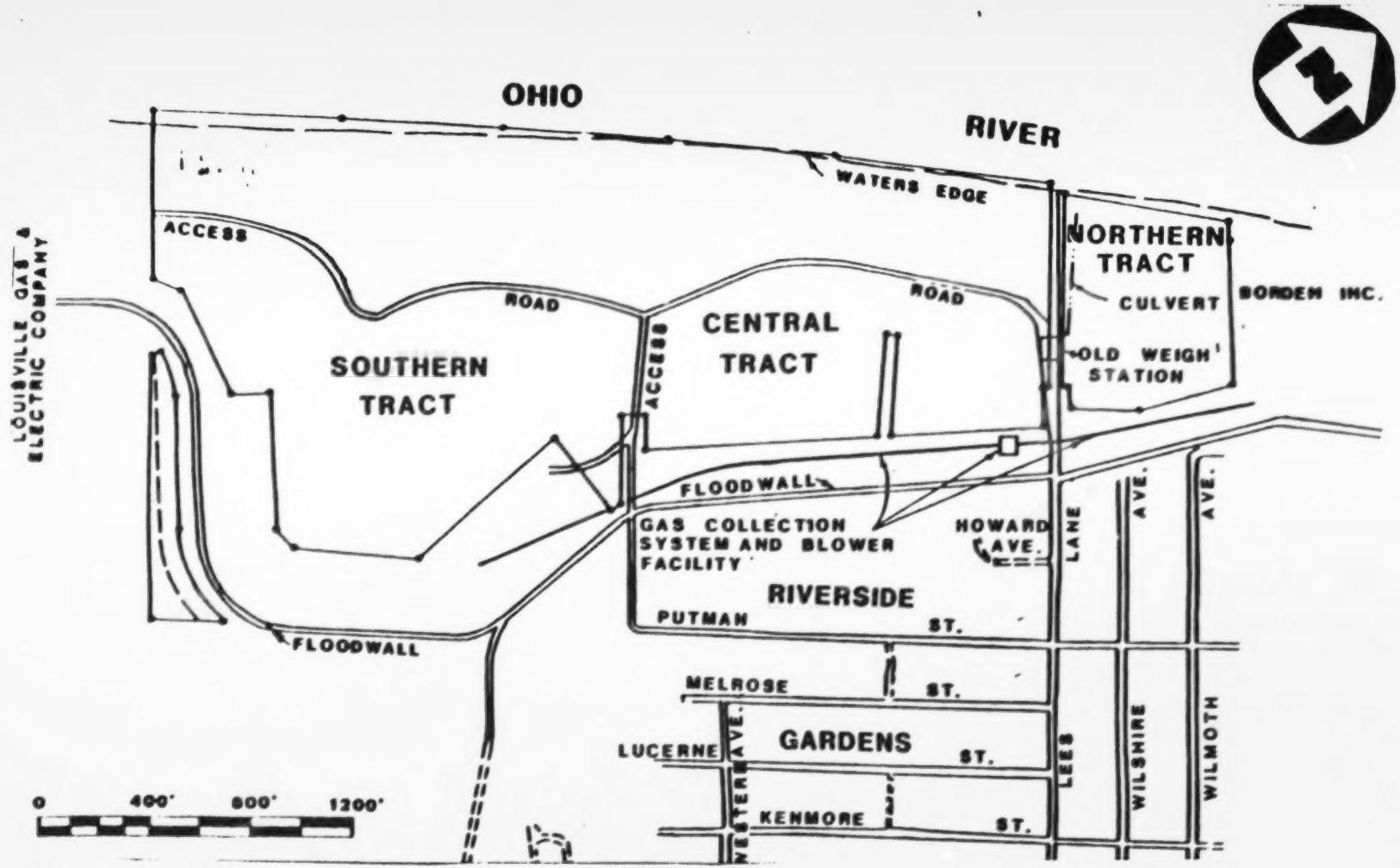


FIGURE 2

SITE LAYOUT, LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

SITE HISTORY

Land use at the Lees Lane Landfill site has included a sand and gravel quarry, a junkyard and a landfill. The period of sand and gravel operations at the site is not known but quarry operation began at least as early as the 1940s. The landfilling operations at the site were reported to have begun in the late 1940s.

The site received domestic, commercial, solid municipal, and industrial wastes over a 27-year period. Available historical records and responses to waste surveys identify that at least 212,400 tons of mixed industrial waste (some drummed) were disposed of at the Lees Lane Landfill by industrial firms from in and around the Louisville area.

Fill areas are located in the central and southern tracts and excavation areas in the northern and southern tracts. Background information for the site indicates that the northern tract excavation area was eventually filled with wastes but that the site was closed before the excavation area in the southern tract was completely filled. A large depression with ponded water now exists where remaining landfill capacity existed at the time of closure.

The southern tract of the site operated under a permit issued in 1971 by Kentucky under its Solid Waste Program. The permit expired in November 1974 and was not renewed by the State. In April 1975, the landfill was closed.

In March 1975, homeowners in Riverside Gardens, a community adjacent to the site, reported flash fires around their water heaters. A subsequent investigation detected explosive levels of methane gas and seven families were evacuated from homes near the site. These homes were ultimately purchased by the Jefferson County Housing Authority. In 1978, extensive monitoring was conducted to define the gas migration problem. A venting system was installed in October 1980.

In February 1980, the Kentucky Department of Hazardous Materials and Waste Management (HMWM) discovered approximately 400 drums on a terrace about 100 feet from the Ohio River bank. Over 50 chemicals were identified, including phenolic resins, benzene, and relatively high concentrations of copper, cadmium, nickel, lead, and chromium. In September and October of 1981, the drums were removed by the Lees Lane Landfill owners under court order. The hazardous wastes were removed from the drums and transported to an approved hazardous waste disposal facility. The remaining nonhazardous drummed materials and the empty drums were buried onsite.

In early 1981, Kentucky Natural Resources and Environmental Protection Cabinet (NREPC) installed shallow groundwater monitor wells at the site. The results showed high concentrations of heavy metals and aluminium. However, the analytical report stated that many of the sample concentrations were probably elevated due to excessive sediment in the samples caused by poor well construction.

The Lees Lane Landfill site was ranked on the National Priorities List (NPL) in December 1982. In May 1983, a Remedial Action Master Plan was completed by the NUS Corporation. In April 1986, the Remedial Investigation/ Feasibility Study (RI/FS) was finalized. This study was conducted by NUS-FIT Corporation.

Site Ownership

The Northern and Central Tracts were owned by Joseph C. Hofgesang until his death on March 10, 1972. Following his death, ownership went to the current owner, the Hofgesang Foundation, Inc., which is a private foundation set up in perpetuity. The Southern Tract was owned until the mid-1960s by Gernert Court, Inc. During the mid-1960s, the company's name was changed to the Joseph C. Hofgesang Sand Company, Inc. This company owned the site until the Kentucky solid waste permit expired in November 1974, at which time J. H. Realty, Inc. acquired it. J. H. Realty, Inc. is the current owner of the Southern Tract.

CURRENT SITE STATUS

Surface Water, Soil, and Groundwater

The Remedial Investigation identified contaminants in the following media: surface water, soil, and groundwater. Onsite surface water contained very low levels of contaminants. Onsite soils and sediments were similar to the offsite background sample collected in Riverside Gardens, suggesting the use of local soils as cover material. Typical offsite soil concentration levels included arsenic (24 mg/kg), barium (92 mg/kg), chromium (20 mg/kg), lead (50 mg/kg), manganese (1200 mg/kg) and iron (35,000 mg/kg). In two areas where "hot spot" soil samples were collected, the estimated concentrations of lead and chromium were 2000 mg/kg (ppm) each. These areas were located along the access road in the central tract. They are believed to be the result of indiscriminant dumping since the concentrations found were not representative of overall soil concentrations.

Onsite groundwater contained low levels of organic compounds and some inorganic contaminants. The major inorganic contaminants included arsenic (87 ug/l), barium (1,100 ug/l), cadmium (22 ug/l), chromium (640 ug/l), lead (150 ug/l), manganese (44,000 ug/l) and iron (190,000 ug/l). The offsite concentrations of these contaminants were all below the maximum contaminant levels (MCL) set in the Interim Primary Drinking Water Standards. Manganese was detected at 610 ug/l in the Louisville Gas and Electric well and at 370 ug/l in an Indiana public water supply (PWS) well. Iron was detected at 8,900 ug/l in an Indiana PWS well, but was below background in both industrial wells. Neither manganese nor iron are considered to have significant health effects.

From the contaminants detected in the RI, lead, arsenic, benzene and chromium were selected as critical contaminants for further evaluation. This selection was based on the frequency of detection and/or chemical, biological, and toxicological properties. Table 1-1 provides a summary of the range of concentrations of the critical contaminants found in the various media at the Lees Lane Landfill Site.

TABLE 1-1
CRITICAL CONTAMINANT LEVELS
IN VARIOUS MEDIA
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

Critical Contaminant	Groundwater ug/l	Surface Water ug/l	Bottom Sediments mg/kg	Surface Soil mg/kg
Lead	0-150	0-10J	10J-100J	50J-2,000J
Arsenic	0-87	0	5.4-27	0-25
Benzene	0-450	0-5J	0-15J	0
Chromium	0-640	0-6.2	9.8-30J	10J-2,000J

J - Estimated value.

0 - Not detected.

Transport Routes - Groundwater

The major route for offsite migration of hazardous materials is groundwater discharge from the site. Most residents in the area use public water; however, approximately eleven homes still use domestic wells tapping the alluvial aquifer. Of these eleven wells, only eight are used for drinking water wells. Of the five drinking water wells sampled, no elevated contaminant levels were detected.

Public Health Assessment

A public health assessment was prepared to evaluate the potential health risks associated with the presence of hazardous substances at the site. This assessment concluded that the primary public health concern at the site was the elevated chromium levels found in onsite groundwater. In order to evaluate potential adverse health effects, the highest chromium concentration, 640 ug/l, detected in the onsite groundwater was used. Although unlikely, it is possible that drinking water containing 640 ug/l of chromium over a period of several years may lead to an increase in the chromium concentration of the liver and spleen. Chronic toxicological effects are possible at this level based on animal studies. No pathological changes have ever been associated with such low levels exposures. The dermal effects from bathing in water containing 640 ug/l would likewise appear remote, although chromium is recognized as a potent sensitizer of skin.

Gas/Air Migration Investigation

EPA tasked IT Corporation to inspect the site for gaseous contaminants and to determine the operational efficiency of the gas collection system. The samples from the gas extraction wells contained both methane and toxic gases demonstrating that the decomposition of landfill wastes is still producing gases with the potential to migrate via the subsurface or air to Riverside Gardens. The results of this investigation also indicated that the system was currently operating at less than 50% efficiency. Since 1980, Jefferson County has monitored the gas and the only time methane has been detected in the gas observation wells in Riverside Gardens was in April and May of 1984, at which time the blower system was not operating properly. This suggests, that although the system is operating at less than optimum efficiency, it is currently controlling lateral subsurface migration.

In November 1985, the Jefferson County Department of Public Works contracted SCS Engineers to inspect the gas collection system. Repairs of problem areas noted during the inspection were begun in December 1985 by Jefferson County under the supervision of SCS Engineers.

In January 1986, EPA launched an extensive air sampling study in order to respond to odor complaints by residents in Riverside Gardens (RG). The sampling plan was developed by EPA, KNREPC, Jefferson County Department of Health and the Agency for Toxic Substances and Disease Registry (ATSDR).

The objective of this plan was to determine if the RG residents are being adversely affected by methane or toxic gases detected in the atmosphere and if the source of these reported gaseous odors is the Lees Lane Landfill Site. The (January - June 1986) sampling program consisted of air/gas samples taken (1) from homes in Riverside Gardens, (2) at and around the vicinity of the landfill and (3) from the exhaust vent stack.

Results of these analyses showed organics present in the media sampled. However, all values were low (ppb). The conclusion drawn from this study is that the data collected does not suggest a health hazard for any potential receptors.

ENFORCEMENT ANALYSIS

EPA initially identified approximately 700-800 companies, individuals, and other entities as potentially responsible parties (PRPs) who had utilized the landfill for waste disposal. Several other companies were identified as PRPs from EPA waste survey forms.

EPA issued its first set of notice letters in June 1984 to the current and former owners and operators of the site, and to companies and individuals who may have disposed at the site. The notice letters offered the PRPs an opportunity to conduct the Remedial Investigation and Feasibility Study (RI/FS).

Many PRPs receiving the initial notice letters either failed to respond to the letter or gave inadequate responses. EPA mailed follow-up notice letters to a number of PRPs on April 1, 1985 in an effort to elicit full and complete responses to the June 1984 notice letters.

In December 1985, EPA issued a second set of notice letters to approximately 130 additional PRPs who had not received the initial notice letter. More than half of these letters were returned unopened to EPA. Further investigation indicated that most of the companies whose letters had been returned were no longer in business.

After reviewing all responses from the two rounds of notice letters, EPA determined that approximately thirty companies and individuals were considered to be PRPs, by virtue of either owning or operating the site, transporting hazardous substances to the site or arranging for disposal of hazardous substances at the site. Between January and March 1986, final notice letters were issued to 25 PRPs advising them that the RI/FS would be completed in March 1986. The letter also encouraged the PRPs to organize themselves into a steering committee for purposes of facilitating negotiation with EPA for the PRPs performance of the Remedial Design and Remedial Action (RD/RA). Consequently, a steering committee was formed by a group of PRPs.

EPA has received very positive indications from the PRPs that negotiations for the RD/RA will be successful. EPA presently anticipates that the consent order for RD/RA can be finalized and signed by September 30, 1986.

The Steering committee is aware that EPA has determined that alternative number three is the Agency's remedy of choice. The Steering Committee appears to be in agreement with this remedy and has not indicated to EPA that another remedy should be chosen.

Negotiations with the PRPs will not exceed 60 days. If the PRPs do not formally commit to perform the remedy with assurances that adequate funding is available to complete the remedy in a timely manner or if a consent order is not signed by September 30, 1986, EPA will proceed with a fund financed RD/RA.

ALTERNATIVES EVALUATION

The Remedial Investigation identified the following future potential public health concerns: 1) elevated chromium levels in the groundwater at and upgradient of the site and 2) the potential release of methane and hazardous gases to the air and subsurface. Since elevated chromium were detected in upgradient wells and no downgradient offsite impacts are evident, no remediation for groundwater was considered at this time.

Therefore, the public health objectives for this remedial action are as follows:

1. Construct a groundwater monitoring program that will serve as an early warning system should site conditions change.

2. Control the vertical and lateral subsurface migration of methane and other gases.

3. Institute a routine monitoring program that will serve to detect any undesirable and possible dangerous levels of methane and/or toxic vapors migrating into the Riverside Gardens neighborhood.

4. Institute an ambient air monitoring program.

The Remedial Investigation concluded that the concentrations of the critical contaminants do not represent a significant threat to the environmental receptors (i.e. plant and animal life) at the Lees Lane Landfill site. Biota in continued direct contact with elevated contaminant levels in selected "hot spot" soil areas may experience symptoms of chronic toxicity; however, no acute toxicological effects would be expected at the current contaminant levels.

Initial Screening of Remedial Action Technologies

A list of preliminary, applicable technologies was developed based on RI data. This list comprised actions that addressed the potential site problems and pathways of contamination identified during the RI. These technologies were then evaluated relative to the following criteria:

(1) technical considerations (reliability, implementability, etc.)

(2) public health and environmental considerations

(3) institutional considerations (permits, other laws, etc.)

(4) cost considerations

If the technology was rejected for use at the site under a particular criterion, it was eliminated from further consideration. (See Table 1-2 for the response action and the rationale for elimination of a particular technology).

Remedial Action Alternatives Retained For Detailed Evaluation

The NO-ACTION Alternative was evaluated in accordance with technical, public health and environmental criteria to determine the effect of not performing additional remedial actions at the site. Under this alternative the low level contamination of the groundwater could continue. Changes in groundwater contaminant level would not be detected, due to the absence of groundwater monitoring. Similarly, the gas collection system may deteriorate and an unknown quantities of gases may be released to the air or migrate into nearby homes, leading to an increased health risk.

The remaining alternatives (Alternatives 1-6) were subjected to detailed analyses involving both non-cost and cost criteria. Non-cost criteria included technical, public health, environmental, and institutional considerations. See Table 1-3 for a summary of remedial action alternatives. Each alternative was assessed for its effect upon the existing floodplains and wetlands. Cost criteria included capital costs, operation and maintenance costs and a present worth calculation. See Table 1-4 for a cost summary of the six alternatives described below:

Alternative 1 - No Remedial Action - Monitoring
Alternative 2 - Gas Collection and Venting System, and Monitoring
Alternative 3 - Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring

Alternative 4 - Capping, Regrading and Revegetation, Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring
Alternative 5 - Excavation and Backfilling, Regrading and Revegetation, Onsite Incineration, Offsite Fly Ash Disposal, and Monitoring
Alternative 6 - Excavation and Backfilling, Regrading and Revegetation, Offsite Disposal, and Monitoring

TABLE 1-2

SCREENING ALTERNATIVE TECHNOLOGIES FOR
APPLICABILITY TO LEES LANE LANDFILL SITE

Remedial Technologies	Retained (R) or Eliminated (E)	Reason Eliminated
No Action		
° No Action	R	
° Monitoring	R	
Alternate Water Supply		
° Municipal Water Supply Hookup	R	
° Bottled Water	E	Short-term solution
° Individual Treatment Units	E	Requires extensive monitoring and maintenance
Containment		
° Surface Capping-Clay	R	
° Bank Protection Controls-Riprap	R	
° Groundwater Barriers	E	Serious construction problems
Diversion		
° Surface Regrading and Revegetation	R-if capping or excavation are performed	
° Levees	E	Additional flooding wou be caused downstream a floods exceeding the 1 year event would overla the new levee and creat turbulence.
° Terraces and Benches	R	

TABLE 1-2 (Continued)

Remedial Technologies	Retained (R) or Eliminated (E)	Reason Eliminated
Collection		
• Leachate Collection	E	Impractical and Infeasible
• Gas Collection and/or venting	R	
• Groundwater Collection	E	Extraction of groundwater from beneath the site through the use of pumping wells is judged not practical and/or effective
Reduction		
• Removal and/or control of surface waste	R	
On-site Treatment		
• Leachate Treatment	E	Leachate collection eliminated
• Incineration-Rotary Kiln	R	
Off-site Treatment		
• Leachate Treatment	E	Leachate collection eliminated
Incineration	E	Problems involved with storage and handling requirements of waste
In-situ Treatment		
• Inplace Treatment of Soils	E	Due to depth of contaminated soils and the unknown nature of waste
Complete Removal		
• Removal of contaminated soil/sediment	E	Levels of contamination in surface media are very low and present no health or environmental hazards

TABLE 1-2 (continued)

Remedial Technologies	Retained (R) or Eliminated (E)	Reason Eliminated
Off-site Disposal		
° Landfilling	R	
° Incineration	R	
On-site Disposal		
° Landfilling	E	Site lies within the 1[illegible] year floodplain. A ne[illegible] landfill could not be constructed in a flood[illegible] consistent with RCRA regulations.
° Incineration	R	

TABLE 1-3
SUMMARY OF REMEDIAL ACTION ALTERNATIVES
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

Alternative	Cost ($) 1,000 Actual	Cost ($) 1,000 Present Worth	Public Health Concern	Environmental Concern	Technical Concern	Other Concerns
No Action	0	0	Gas migration and direct contact with surface wastes	Leachate and waste release to Ohio River	-	Community disapproval
No Remedial Action Monitoring	391	341	Gas migration and direct contact with surface wastes	Leachate and waste release to Ohio River	-	Community disapproval
Gas Collection and Venting System, and Monitoring	647	439	Direct contact with surface wastes	Leachate and waste release to Ohio River	-	-
Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring	2,909	2,682	Minimal	Leachate release to Ohio River	-	-
Capping, Regrading and Revegetation, Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring	42,683	15,946	Minimal	Leachate release to Ohio River	Time for implementation Cap damage from Ohio River runon during flooding	Transportation of capping material through Riverside Gardens
Excavation and Backfilling, Regrading and Revegetation, Onsite Incineration, Offsite Fly Ash Disposal, and Monitoring	418,112	165,766	Gas and particulate migration during excavation	Migration of wastes from flooding during excavation	Coordination of excavation and incineration. Time for implementation	Transportation of wastes through Riverside Gardens
Excavation and Backfilling, Regrading and Revegetation, Offsite Disposal, and Monitoring	649,279	261,538	Gas and particulate migration during excavation	Migration of wastes from flooding during excavation	Coordination of excavation and transportation of wastes. Time for implementation	Transportation of wastes through Riverside Gardens

TABLE 1-4

SUMMARY OF CAPITAL O&M AND PRESENT WORTH COST FOR
REMEDIAL ACTION ALTERNATIVES LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

Alternatives	Capital Costs ($) 1,000		O&M Costs ($) 1,000*		Total Cost ($) 1,000	
	Actual	Present Worth	Actual	Present Worth	Actual	Present Worth
1	106	106	285	235	391	341
2	132	132	515	307	647	439
3	2,343	2,343	566	339	2,909	2,682
4	42,067	15,589	616	357	42,683	15,946
5	39,906	24,051	378,206	141,715	418,112	165,766
6	648,971	261,295	308	243	649,279	261,538

* O&M Costs are shown for a three-year period.

Alternative 1 No Remedial Action - Monitoring

This alternative does not address the remediation of the site nor the potential threat to the public or the environment via the contamination pathways. However, a multi-media monitoring program will provide information so that possible adverse public health or environmental impacts that may arise can be addressed. Based upon the conclusions of the Remedial Investigation (RI), gas migration is considered a significant problem at the site. Therefore, at a minimum, an air monitoring program would be implemented followed by the installation of gas monitoring wells, and implementation of the gas and groundwater monitoring programs.

Alternative 2: Gas Collection and Venting, and Monitoring

This alternative includes a gas, air, and groundwater monitoring program, the provision of a properly operating gas collection system and consideration of a possible future alternate water supply. Any problems remaining in the gas collection system would be corrected after a determination of the extent of the necessary modifications to the system is made. Implementation of this alternative would ensure that gas migration, the most significant potential problem at the site, is addressed.

Alternative 3: Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring

This alternative includes the monitoring program described in Alternative 1, the provision of a properly operating gas collection system, consideration of a future alternate water supply, cleanup of the surface waste areas, and bank protection controls. The monitoring program included in this and the following alternative contains provisions for the sampling of an additional groundwater monitor well to aid in determining alternate concentration limits (ACLs). Surface waste cleanup would involve removal of exposed drums, capping of "hot spot" soils and an area containing exposed trash. The drums would be analyzed prior to excavation and removed to an approved landfill. Riprap would be installed to minimize erosion potential and failure of the Ohio River embankment. The entire bank (29 acres) along the Ohio River would be stabilzed. In addition, cautionary signs, will be posted. One gate would be installed at the Putnam Street access point.

Alternative 4: Capping, Regrading and Revegetation, Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring

In addition to monitoring, surface waste area cleanup, bank protection controls, gas collection and venting system, and consideration of a possible future alternate water supply, a cap would be installed over the entire landfill to minimize leachate generation from infiltrating rainfall and to control vertical movement of gas. Regrading and revegetation will be neccessary to provide maximum drainage of the area. Both the capping and bank protection controls would require some clearing of vegetation.

This onsite alternative will comply with other appropriate environmental laws. The cap described above would meet the criteria outlined in RCRA.

Alternative 5: Excavation and Backfilling, Regrading and Revegetation, Onsite Incineration, Offsite Fly Ash Disposal, and Monitoring

The site is estimated to have a total volume of 4,400,000 cubic yards; however, based on site sampling, ferromagnetic surveys, and historial photographs approximately 2,400,000 cubic yards will be excavated. The depth of excavation will vary widely at the site ranging from 5 feet in portions of the central tract to 40 feet in parts of the northern tract of the landfill. Backhoes and power shovels will be used for the removal of surface material and any additional dry fill, while draglines will be employed for the removal of wet fill. Following excavation the site will be backfilled, regraded and revegetated. Backfilling will be conducted concurrently with excavation to maintain the integrity of the landfill and prevent the accumulation of water. Backfill material will be brought from offsite sources, since no onsite source is available. After segregation of the 2,400,000 cubic yards of waste excavated, approximately 1,560,000 cubic yards are expected to be suitable for incineration and the remainder should be segregated and disposed of at an appropriate landfill.

Byproducts of the incineration process include products of incomplete combustion, fly ash, and atmospheric emissions. The fly ash, due to potentially high metals concentrations, will be disposed of in an approved RCRA landfill. Atmospheric emissions will be controlled by a venturi scrubber, with scrubber water neutralized with lime prior to discharge. Additional treatment of existing gases and wastewater may be required and will be evaluated prior to construction.

This alternative will include the monitoring program discussed in Alternative 1.

Alternative 6: Excavation and Backfilling, Regrading and Revegetation, Offsite Disposal, and Monitoring

In addition to monitoring, this alternative will result in the excavation and offsite disposal of approximately 2,400,000 cubic yards of fill in a RCRA approved landfill. Excavation and backfilling, regrading and revegetation have been described in Alternative 5.

Comparsion of Remedial Alternatives

The NO-ACTION alternative did nothing to remedy public health and environmental concerns (i.e. direct contact to "hot spot" areas, the potential for gas migration to impact Riverside Gardens, and possible migration of contaminated groundwater). These actions were determined to be a necessary part of any remedy. Therefore, the NO-ACTION alternative was eliminated from further consideration.

The NO-ACTION - MONITORING alternative would not reduce or eliminate any of the impacts resulting from the site contaminants. It would only provide information about the movement of the contaminants so that future remedial actions could be taken when necessary. Public health concerns such as gas migration and direct contact with surface waste would not addressed; therefore, this alternative was eliminated.

ALTERNATIVE 2 which includes a properly operating gas collection and venting system in addition to a monitoring program was also eliminated from further consideration because all applicable public health concerns were not addressed (i.e. direct contact to "hot spot" areas).

ALTERNATIVE 3 would address the potential release of methane and hazardous gases to the air and subsurface by providing for a gas and air monitoring system. It would also provide for a groundwater monitoring program to establish baseline conditions at the site and also to serve as an early warning of contaminant migration. Riprap would be installed to prevent erosion of the Ohio River bank. Direct contact to hot spot areas and exposed drums would be remediated by capping "hot spot" areas and removing drums. The remedial action components described above would achieve the public health and environmental objectives established in the Remedial Investigation at the lowest cost; therefore, it was chosen as the preferred alternative.

ALTERNATIVE 4, landfill capping, a well documented technology, would serve to minimize the generation of leachate resulting from surface water infiltration and control vertical movement of gas generated in the landfill However, capping was not considered appliable for the site due to the following reasons: (1) the site lies in a floodplain, (2) capping the site would erhance the lateral migration of gases and possibly exacerbate the problems with the gas collection and venting system, (3) the site is well-vegetated with trees, shrubs, and brushes etc; capping would involve clearing the site and re-vegetating the area, and (4) implementation of this remedy could require a long period of time to complete (22 years) and (5) the potential public health risk associated with the transport of large amount of waste through the neighborhood. Therefore, Alternative 4 was eliminated.

ALTERNATIVE 5, onsite incineration, is also a well-established technology and would effectively destroy all principal organic hazardous constituents found in the waste material. However, this technology would not be suitable for the decompostion of many of the metals found onsite. The implementation of Alternative 5 has the potential to significantly impact public health. During the excavation procedure, especially with methane gas present, the opportunity for offsite migration of contaminants is greatly increased. Pathways for this migration include airborne particulates gas emission and surface runoff. Receptors in the area would be susceptible to inhalation of gas as well as contaminant laden particulates, the ingestion of particules and direct contact with wastes. The technical feasibility associated with this remedy is also of concern. The implementation time associated with costs for this alternative is 24 years.

ALTERNATIVE 6, disposal of waste in an offsite landfill, is a permanent remedial action and would provide a very high level of environmental and public health protection at the site. It would prevent any further movement contamination. Implementation problems associated with this remedy include coordination and transporation of a large quantity (2,400,000 cubic yds.) of material to be excavated. Due to the volume to be disposed, it may be necessary to utilize more than one landfill facility.

The costs for implementation of Alternatives 5 and 6 would be $418,112,000 and $649,279,000, respectfully. These costs are two orders of magnitude higher than Alternative 3 which also addresses the identified public and environmental concerns at the site. Therefore, selection of these alternatives would not be cost effective.

COMMUNITY RELATIONS

A public meeting was held on October 14, 1985, to present a summary of the RI/FS process and to explain the proposed remedies for the cleanup of the landfill. To aid in this presentation a fact sheet was prepared for the meeting. The public comment period officially closed on Nov. 6, 1985. Comments received were responded to and are in summary form in the attached Responsiveness Summary.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

The NCP requires that other environmental laws be considered in determining the appropriate action for the site. Other environmental laws which may be applicable or relevant and appropriate to the recommended alternative are the Resource Conservation and Recovery Act (RCRA), Floodplain Management Executive Order (E.O. 11988) and the Wetland Executive Order (E.O. 11990).

The provisions of RCRA applicable to the recommended alternative at Lees Lane Landfill would be 40 CFR Part 263, Standards Applicable to Transporters of Hazardous Waste, and the 40 CFR 264 subpart F Groundwater Protection Standards. The regulations set forth in 40 CFR Part 263 would apply to the transportation of the drums removed. Transporters are required to obtain an EPA identification number, register the material in accordance with the manifest system requirements and perform analyses of the drum contents to meet these requirements.

The RCRA Groundwater Protection Standards require corrective action if hazardous constituents are found in groundwater in excess of established concentration limits or above background levels. However, if it can be demonstrated that an alternative concentration limit (ACL) will not pose a substantial present or potential hazard to human health or the environment, then corrective action is not required. The current groundwater conditions does not present an immediate threat to the public health and the environment. Based on the hydrogeology at the site, it is expected that two years of

groundwater data will have to be assembled before the ACL demonstration process can be initiated. The proposed monitoring systems will enable us to establish an ACL for this site. After ACLs are established the Agency will decide if further groundwater remedies are necessary.

The Floodplain Management Executive Order may not be applicable because the excavation and removal of the exposed drums and "hot spot" and bank protection controls should have little effect on the floodplain. The Wetland Executive Order would not be applicable because this alternative involves remedial methods outside the wetland area.

RECOMMENDED ALTERNATIVE

Alternative 3 was chosen as the recommended alternative for implementation at the Lees Lane Landfill site. This alternative is cost effective and will effectively mitigate and minimize threats to and provide adequate protection of public health, welfare and the environment. The total capital costs associated with this remedy is $2,343,000. The capital cost for surface waste area cleanup is sensitive to the number of drums and size of areas to be covered. Due to the variable nature of drum removal a 15 percent factor was used for the sensitivity analysis. The bank protection controls are sensitive to the total area to be protected and cleared and a variation of 20 percent in capital costs was used in the sensitivity analysis. These variations resulted in a range costs from $2,243,000 to $3,123,000.

OPERATION AND MAINTENANCE (O & M)

Operation and maintenance activities include inspection of the gas monitoring wells, quarterly gas and groundwater sampling and analysis, and sampling of air three times per year. Other O & M activities include inspection and maintenance of the gas collection system, capped waste areas, and the riprap along the Ohio River bank.

The total projected O & M costs excluding the O & M costs for monitoring gas, groundwater, and air after the 3rd year is $566,000. After three years of monitoring, the monitoring plan will be re-evaluated by EPA. (See Table 1-5 for cost summary of capital and O & M cost).

SCHEDULE

ACTIVITY	DATE
Finalize EDD	September '86
Sign Consent Order	September '86
Draft Remedial Action Plan Deliverable	November '86

TABLE 1-5
COST SUMMARY - SURFACE WASTE AREA CLEANUP, BANK PROTECTION CONTROLS, GAS COLLECTION SYSTEM, AND MONITORING
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

A. Estimation of Costs(1)

Alternative Components	Time to Construct (Yr.)	Capital Costs ($)	O & M Costs ($) Period (Yr.)	O & M Costs ($) Annual ($)	O & M Costs ($) Total ($)	Total Costs ($)
1. Monitoring	1	105,000	1 3	24,000(2) 94,870	309,000	414,000
2. Gas Collection System	1	26,000	30	7,680	230,000	256,000
3. Surface Waste Areas	1	294,000	30	120	3,600	298,000
4. Bank Protection Controls	1	1,917,000	30	770	23,000	1,940,000
5. Gate and Signs	1	1,000	-	-	-	1,000
Total Costs		**2,343,000**		**127,440**	**566,000**	**2,909,000**

(1) All costs are rounded to the nearest 1,000 dollars, except O & M.

(2) Costs for complete Appendix VIII analyses on one well quarterly the first year.

FUTURE ACTIONS

Future actions at the site will include Operation and Maintenance activities.

LEES LANE LANDFILL

LOUISVILLE, KENTUCKY

DRAFT RESPONSIVENESS SUMMARY

This community relations responsiveness summary is divided into the following sections:

Section 1.0 Overview. This section discusses EPA's preferred alternative for remedial action, and likely public reaction to this alternative.

Section 2.0 Background on Community Involvement and Concerns. This section provides a brief history of community interest and concerns raised during remedial planning activities at the Lees Lane Landfill Site.

Section 3.0 Summary of Major Comments Received during the Public Comment Period and the EPA Responses to the Comments. Both written and oral comments are categorized by relevant topics. EPA responses to these major comments are also provided.

Section 4.0 Remaining Concerns. This section describes remaining community concerns that EPA did not address directly during the Remedial Investigation/Feasibility Study, and how EPA proposes to handle these concerns.

In addition to the above sections, Attachment A, included as a part of this responsiveness summary, identifies community relations activities conducted at the Lees Lane Landfill Site prior to and during the public comment period.

1.0 OVERVIEW

At the time of the public meeting and the public comment period, EPA had not selected a single preferred alternative for the Lees Lane Landfill site. Instead the draft feasibility study presented six (6) alternatives. These alternatives address the problems of groundwater contamination, soil contamination and the potential for gas migration into the Riverside Gardens community.

The recommended alternative that will be specified in the decision document involves surface waste area cleanup, bank protection controls, gas collection and venting system, and monitoring. The monitoring program includes sampling groundwater monitoring wells to determine baseline groundwater quality at the site. The surface waste clean-up will reduce the possibility of direct contact since site access is not restricted. The installation of bank protection controls will minimize erosion and failure of the Ohio River bank.

Judging from the comments received during the public meeting and the three week comment period, the residents of Riverside Gardens believe that EPA should consider an alternate solution to the problem. The residents would prefer relocation and buy-out of their homes and property as a viable solution.

Section 3.0 provides a more detailed discussion of individual preferences and concerns.

2.0 Background On Community Involvement And Concerns

Community involvement at the Lees Lane Landfill has centered primarily around Riverside Gardens residents. They established the Riverside Gardens Community Council in 1969. This council was recently headed by Jo Anne Schlatter, but is now under the leadership of Pat Moran.

The first official complaint was filed with the county in 1964, after which complaints from residents of Riverside Gardens were filed frequently. Fires, lack of proper cover, excavation of the flood wall, open dumping, chemical dumping, midnight dumping, and foul odors were all cited complaints filed with the Jefferson County Health Department. Methane gas began entering homes adjacent to the landfill during the spring of 1975.

The Riverside Gardens Community Council is actively monitoring all developments at the landfill and have been highly vocal in expressing their concerns to the county, state, EPA, and the local media.

The major concerns expressed during the remedial planning activities; and how EPA, the county, and state addressed these concerns are described below:

1) Has the problem of methane gas been permanently solved or will we be threatened once again?

EPA Response:

Based on the data gathered during the Remedial Investigation, the gas collection system is working toward alleviating problems related to the migration of landfill-gas to the Riverside Gardens area. EPA's recommended remedy involves inspection and repair of the gas collection system along with air and gas monitoring. Therefore, we will be forewarned of any potential problems that might evolve.

2) Will air emissions from vented gas pose a health threat to the community?

EPA Response:

EPA is currently implementing an air study at and in the vicinity of the Lees Lane Landfill site to address health related concerns. EPA cannot make a determination regarding these health issues without more representative air data. However, the samples that we have analyzed do not show any elevated levels of contaminants.

3) Local officials questioned know whether EPA would fund a long-term monitoring and gas venting system.

EPA Response:

EPA's recommended alternative includes inspection and repair of the monitoring and gas venting system. Responsible parties for the site will be given an opportunity to implement this remedy. If they choose not to participate, then Superfund monies will be appropriated, if applicable. Operation and Maintenance (O&M) will be provided by EPA for one year and the State will be responsible for the remainder of the O&M period.

4) What about the potential for groundwater contamination?

EPA Response:

EPA recognizes that there is a potential for groundwater contamination from the site. Therefore, EPA's recommended remedy includes groundwater monitoring for a period of time.

5) What are the contaminants in the landfill and what effect will these have on the community?

EPA Response:

The site was used for disposal of domestic, commercial, and industrial waste. Due to health risks involved with drilling through the fill, the nature and extent of the waste was not characterized.

Based on the Remedial Investigation, a Health Assessment was developed which evaluated potential health risks associated with the presence of hazardous substances at the site and the effects of these substances on groundwater, surface water and sediment. The assessment concluded that there was no current evidence of an offsite problem related to the landfill site. (The presence of hazardous substances in the air or landfill gas is currently being addressed though a seperate EPA study and will be evaluated in a separate report at a later time).

6) Is there a health threat from the chemicals migrating off site?

EPA Response:

The Public Health Assessment in the Remedial Investigation concluded that there is no current evidence of an offsite problem related to the groundwater, surface water, or sediment at the landfill site. (A separate air study is presently being conducted by the EPA and the results will be evaluted in a later report). If an offsite migration problem does evolve, then the issues will be evaluated.

7) Since people are hunting and our children are still playing on the property, what is EPA going to do about the open access to the landfill?

EPA Response:

EPA's recommended alternative will include posting cautionary signs. These signs will inform the public of the site conditions and potential risks.

8) How will you keep us, public officials, up-to-date on site activities and plans that EPA is developing?

EPA Response:

EPA will keep the State informed of site activities and plans for the site. The State requested that they be responsible for contacting county and local officials.

9) Will the landfill ever be used as a dump again? Can it be developed? Can access to the river be restored? Will the community ever be able to use the land?

EPA Response:

Future land use for the site has not been determined.

10) Jefferson County wanted to know whether the Superfund Program would pay for both past and future cleanup costs?

EPA Response:

Since responsible parties have been identified for this site, they will be given the opportunity to settle the cleanup costs with the Agency. If they choose not to come forward and Superfund monies are expended, the Agency may seek legal recourse to recover the monies spent.

3.0 SUMMARY OF PUBLIC COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

Comments raised during the Lees Lane Landfill Site public comment period are summarized briefly below. The comment period was held from October 15 to November 6, 1985 to receive comments from the public on the draft Remedial Investigation/Feasibility Study. The comments received during the comment period are categorized by relevant topics. At the time of the public comment period, EPA had not selected the recommended alternative.

Technical Questions/Concerns Regarding the Site History

1.0 What chemicals were found in the 400 drums in the landfill?

EPA Response: Organics, heavy metals, phenol, and benzene were found in the drums.

2.0 What was the condition of the 400 drums found on the landfill?

EPA Response: The exposed drums were badly rusted.

Technical Questions/Concerns Regarding RI/FS

3.0 Do you know if there is any groundwater contamination at locations other than where you sampled?

EPA Response: The groundwater program in the RI was used as a basis to determine the overall groundwater quality on and off site.

4.0 How do we remove the barrels out of the landfill? How do you clean up the landfill? We would like to see the waste removed.

EPA Response: The only technology that would actually be able to take the waste out would be excavation. The material itself could be either incinerated or taken to an approved landfill for disposal.

5.0 Will you excavate the entire landfill?

EPA Response: At this time EPA has not decided on the remedy.

6.0 Has EPA or any other level of government considered relocating the residents in the neighborhood?

EPA Response: EPA has not considered relocation as a remedial alternative.

7.0 This study is incomplete because only certain areas were investigated.

EPA Response: The Remedial Investigation was designed to adequately characterize the site. Due to both time and cost factors involved, it was impossible to cover all areas.

8.0 Why wasn't a fence put around the site? Why weren't warning signs posted to keep people off the landfill?

EPA Response: Posting signs and erecting a fence will not necessarily limit the number of people from going on site. People will climb the fence and the signs will be ignored. However, EPA is considering posting signs as part of the remedial alternatives.

9.0 According to the report, the 212,000 tons of waste were used to estimate the total amount of waste in the landfill. So am I correct in saying that the 2.4 million cubic yards is just from the four companies?

EPA Response: The total volume of waste estimated in the landfill was 2.4 million cubic yards. This number was derived by geophysical methods and also information gathered during the Remedial Investigation.

10.0 You stated that there were two residential homes and a church on wells that are being used for a water supply. I know positively that there are five families.

EPA Response: We would appreciate their names and addresses. During the RI we canvased the neighborhood in an effort to find every well we could.

EPA Clarification: The final Remedial Investigation/Feasibility Study Reports identified a total of 8 private drinking water wells in the Riverside Gardens neighborhood.

11.0 What do you think will happen when the chemicals that are in the landfill go into the Ohio River?

EPA Response: In order to determine the worst case for potential groundwater contaminants to enter the Ohio River, the groundwater flow was calculated using the highest permeability value and hydraulic gradient. The dilution rate was estimated to be 67,000 to 1. This means that the flow rate in the Ohio River is so great that it is 67,000 parts of Ohio River to every one part that comes out of the landfill.

12.0 What do you have to say about the radioactive waste over there?

EPA Response: Radiation was not detected at the site during our site investigation.

13.0 How much did the study cost?

EPA Response: The cost of the study should be around $500,000.

14.0 Have any PVC's or any other cancer causing chemicals been found at the landfill?

EPA Response: Benzene and polyvinyl chloride were detected in one of the gas studies.

15.0 Did the 212,000 tons of waste just come from four companies? In the report it states that over 100 companies dumped in the landfill. Do you have records of how much they dumped?

EPA Response: Yes, the four companies are responsible for the 212,000 tons of waste. We do not have records of how much the other 96 companies dumped at the landfill. Identifying companies and the amount of waste they dumped is a part of the enforcement process.

16.0 A citizen stated that he knows that the sand pits were at least 150 to 200 feet deep.

EPA Response: EPA based their estimated depth on the data collected during implementation of the gas collection system. The maximum depth of waste which was detected is approximately 40 feet. The water table is approximately 50 feet below the ground surface. To excavate beyond 50 feet would require a dewatering process. If the site is 100 feet deep, this means we have miscalculated the quanity of waste and therefore the cost to remove the waste would be greater than we estimated. This calculation would only be important if excavation was chosen as the recommended remedy.

17.0 What does EPA plan to do with the drums that are along the river?

EPA Response: As part of the remedial action, the drums will be sampled and if they are hazardous, they will be removed.

EPA Clarification: The Feasibility Study includes the removal of these drums. Prior to removal, samples will be collected for use in determining the proper means of disposal.

18.0 A citizen stated that the liquid is running out of the drums into the Ohio River. I am concerned about our water supply.

EPA Response: The Emergency Response Unit inspected the drums and concluded that they did not pose an immediate threat to the public, and therefore, did not require an emergency removal. It was decided that these drums would be addressed during the remedial action phase.

Questions/Concerns Related to Gas Migration

19.0 Why wasn't the venting system maintained after it was installed to control the migration of methane gas to Riverside Gardens?

EPA Response: This question should be referred to the county government. The Public Works Department is responsible for Operation and Maintenance of the gas collection system.

20.0 Initially, I believe you were trying to keep us from being blown up in an exposion by the gas. But now it appears that you are suffocating us. The vent pipe is blowing all over Riverside Gardens. Am I right or wrong?

EPA Response: Supposedly, the system was designed to burn the gas off before it is vented to the atmosphere. Although I'm not sure if the gas is being burned, I do know that the blower house is working because you can hear it blowing.

EPA Clarification: A burner was not installed as part of the gas collection system.

21.0 What if rocket fuel was dumped into the landfill? There is a rumor that a local chemical company manufactured rocket fuel for Redstone Arsenal.

EPA Response: I assume you are talking about hydrozene, the most common rocket fuel used today. If it were spilled or dumped out, it would have volatized, hence, no longer being a problem. If it hasn't been exposed to the air, then it would depend on the concentrations in the well.

22.0 The generation of methane could last 20 years based on EPA's fifty foot depth of the waste in landfill. So, if it is 100 to 150 feet deep, does that mean a 60-year time period of methane being generated in the landfill.

EPA Response: It would be hard to estimate how long methane will be generated in the landfill. The amount of time that methane can be generated varies.

23.0 Wouldn't it have been feasible to find out which way the wind blew before the venting system was ever installed?

EPA Response: We have a report that shows the prevailing wind direction most of the time. However, the wind doesn't blow in the same direction all the time.

24.0 Is this venting system safe?

EPA Response: Yes, the system is safe if it is operating properly and if the gas is being burned.

EPA Clairification: Based on our knowledge if the venting system is operating properly, the system is safe.

25.0 Do you have a pump that is pumping the gas?

EPA Response: The gas collection system was designed to include a series of 31 wells. They are all tied into a common header and they are under negative pressure. They pull all this gas into the blower house.

26.0 Is the gas burned or just discharged into the atmosphere?

EPA Response: They should have a propane supply down there that actually burns this gas.

Correction to EPA Response: EPA's response was not correct. The gas venting system was designed to have a burner but it was decided by the county not to include it. The gas would be vented to the atmosphere.

27.0 How often is the pump checked?

EPA Response: You need to check with the county. They are responsible for maintaining the venting system.

28.0 How can we believe you, the EPA, the County Health Department and county government when the venting system has been allowed to get in its present condition?

EPA Response: Again, the upkeep of the venting system was the responsibility of the Public Works Department, Jefferson County. If the repair of the system is chosen as one of the recommended alternatives, then the operation and maintenance of that system will be the responsibility of EPA the first year, then it will be the state's responsibility.

29.0 Did the county receive the report in December of '84 that reported the venting system was working at 42 percent? Why didn't the company that did the gas evaluation report send a copy to the county.

EPA Response: That was an oversight, probably on EPA's part. If the conclusions drawn from that study had determined that there was a great threat to the public health, everyone would have been made aware of the danger. The report was included as part of the remedial investigation and feasibility study and the county was given that report.

30.0 How long was the venting system off and what amount of time did it take with the system off for the gas to be detected?

EPA Response: I have no idea. When we saw the data that showed a reading, we did question them. The data sheet said the blower house was off. That is what drove us to the conclusion that when the blower house is on, that the system is still working.

31.0 Is special monitoring being conducted in areas where the test wells are located to find out if anything has been migrating in those particular areas?

EPA Response: The field work was completed before we were made aware of the residents complaints. When it was brought to EPA's attention we did in fact come out and sample. We have also committed to further sampling and monitoring. We have been working with Pat Moran trying to find out when there are complaints of the gas in the neighborhood. When the odor is detected, we will be available to come down and do some air sampling. As far as the air sampling is concerned it is not cut and dry. We are still committed to coming out and addressing that issue.

32.0 What do you have to compare with the air samples in 1984?

EPA Response: Gas well air samples from the previous studies are included in this report. These samples were taken in probes I-3B, I-4B, I-5B and I-10B. I don't believe ambient air samples are included in the report because the ambient air samples did not detect anything. Ambient air samples were taken. I have copies of the results back in my office which can be made available to you.

33.0 What does it mean when the report talks about the volume of the methane in the wells being 83 percent?

EPA Response: If you have a cup filled with 100 percent of air, 83 percent of the air would be methane.

34.0 Do you know the percentage of the methane that is being vented into the atmosphere?

EPA Response: I have no idea. I don't think a sample has ever been pulled from that vent. However, if methane was being vented into the atmosphere, it would not be a volume of 83 percent because the atmosphere has a larger volume than the well space.

35.0 If a test were done on one of the venting systems that was working properly, you should have zero methane, or no trace of methane, is that right?

EPA Response: Right, (if there is a burner on the gas collection system) there should be no methane, but as far as I know no samples have been taken.

EPA Clairfication: There is no burner on the gas collction system and therefore, methane should be detected in the exhaust.

Health Related Questions/Concerns

36.0 What adverse health effects are we being subjected to by breathing this air daily which contains chemicals/gases from the landfill?

EPA Response: EPA has committed to doing more air monitoring in the neighborhood. At this time none of the studies show that there are ambient air problems.

37.0 Has EPA or CDC canvassed the neighborhood to see if there are any birth defects or a type of cancer which is prevalent in the neighborhood? How can you say that there is no problem yet, since you haven't gone to the neighborhood to see?

EPA Response: To answer your first question, no, we have not canvased the community. And at this point we have no intentions of doing it as you propose. The main reason being, we see no indication that there is an imminent public health threat being posed to people living in Riverside Gardens from Lees Lane Landfill. If that were the case, we would work cooperatively with both the Louisville and Jefferson County Health Department and the State Health Department in Frankfort to determine whether or not the alleged problems may in fact be due to or were due to exposures to substances coming from the site.

38.0 This site appears to be similar to Love Canal. No, the school isn't located on top of the landfill, but the community is around the landfill. At Love Canal the barrels started surfacing and it took them a long time before they finally got the EPA and everybody to say that there was a problem. I wouldn't want that to happen here.

EPA Response: I agree with what you are saying. That is one of the reasons that we have listed monitoring in all the remedial alternatives so that we would be able to identify a problem if one arises and also define the extent of the problem.

39.0 Would you feel safe with your families living in this neighborhood?

EPA Response: Based on the data and information we have looked at so far, yes I would. The site does not pose an imminent health threat but the area is unsafe for children playing at the site.

40.0 Have you talked with the Fire Department or the Police Department about what goes on back here? The Fire Department evacuated a family in 1983 for two nights, allegedly because of dangerous gas from the landfill.

EPA Response: No, we have not talked with these two departments but we are interested in their opinion.

41.0 How dangerous is the water to us when the groundwater level is up for just a short period of time?

EPA Response: It should not be dangerous at all.

42.0 What about future health concerns? What are we going to learn in the next five to ten years from living in these conditions?

EPA Response: One of the things we hope you try to realize, and be sensitive to as well, is that we don't have all the answers. There is a lot that we don't know, and we just have to deal with that the best we can.

43.0 Everything that I have read in the report talks about explosion potential and so forth. What about health effects from the gas, especially when the water level has been up for three or four months?

EPA Response: In order to fully address your concerns, we need to first establish a link or have a strong suspicion that a link exists between the residents' health complaints and the landfill.

Technical Questions/Concerns Regarding Future Actions

44.0 Could an industry be put on the landfill after your next action?

EPA Response: This decision will be made by the county zoning department.

45.0 Why not let the City of Louisville buy this whole neighborhood and make a dump out of it?

EPA Response: We cannot respond to that question.

Questions/Concerns regarding the Superfund Process

46.0 Is this the only input we will get or do the people have anything to say about the remedial decisions? Are you just going to take our opinion and then you (EPA) make the decision?

EPA Response: The process works as follows: After tonight you will have until November 6th to comment on the remedial reports. We will then respond to those comments in a responsiveness summary. You will be informed on the selected remedy.

47.0 So how do we get people to respond? Do we have to write letters? What do they have to do?

EPA Response: Your should send your written comments to the EPA office, addressed to me, Beverly Houston. Our address may be found in the back fo the fact sheet. We would like to strongly encourage you, if you do have a question or a concern, to make us aware of it. All comments will be included in the responsiveness summary, including those made here tonight.

Question/Concerns Related to the Enforcement Process

48.0 Are there any funds available to do any remedial action down here?

EPA Response: Since this is an enforcement site, there are potentially responsible parties (PRP's). PRP's are people responsible for putting the waste in the landfill. The enforcement section at EPA is currently in the process of identifying and noticing those people that there is a problem and also giving them the opportunity to actually implement whatever remedial action is determined to be correct remedy. So the first option is to try to get the potentially responsible parties to come forth any pay for the clean-up. If the PRP's say no, we are not going to do anything, then EPA will come forth and actually implement the remedy. Once the PRP's have been notified, they will have 60 days to come forth and commit to doing the remedial action. So at this point it is hard to say who will pay for the clean-up.

Written Comments/Questions Received by the Agency

49.0 "Has any calculation been made of the anticipated levels of methane and other gas production, and production of volatile organics, over the future life of the landfill? How can a collection system be designed, without knowing the anticipated production levels which it will be designed to handle?"

EPA Response: We are not aware of any calculations being made of the anticipated levels of methane and other gas production, and production of volatile organics, over the future life of the landfill. The gas collection system was designed to prevent the gas in the landfill from migrating to the Riverside Gardens area. Gas production levels were not directly utilized in the design of the system.

EPA Clarification: Concentrations of contaminants are not necessary to design a collection system but could impact a treatment system if one were necessary.

50.0 "Has any testing been conducted by EPA to determine the nature and threat from the 11 unidentified organics that were detected by IT Corporation in the assessment of the gas collection system? What are the constituent toxics being collected and emitted into the community from the gas collections system?"

EPA Response: EPA is currently conducting an air study at and in the vicinity of the site. In this investigation target and non-target compounds are being identified. Target compounds identified in the parts per billion range were vinyl chloride, benzene, toluene, ethylbenzene, and xylene.

EPA Clarification: Concentrations of contaminants are not necessary to design a collection system but could impact a treatment system if one were necessary.

51.0 "The county gas collection system apparently did not include the designed gas burner. What stack monitoring has and will be conducted to determine the organics content of the gas which is now being collected, concentrated and emitted into the vicinity of the Riverside Gardens neighborhood"? What ambient monitoring is being conducted on a continuing basis (rather than on one dry-weather day) to determine the ambient levels of gases in the neighborhood?"

EPA Response: EPA is currently conducting an air study at and in the vicinity of the site. Representative samples are being collected over varied times and climatic conditions. Stack, background, indoor and outdoor samples are being collected.

EPA Clairfication: The air monitoring system proposed in the Feasibility Study includes six sampling stations on the landfill that would be monitored three times a year. This program may be altered as a result of the air sampling currently being conducted by EPA.

52.0 "What testing has been conducted at the Putman Avenue sites where the high concentrations of methane and organic-laden gases were first detected in 1975 in order to determine whether the county gas collection system is functioning so as to control gas migration? What testing will be conducted to determine the current degree of gas migration?"

EPA Response: Two residences on Putman Avenue have been selected as target areas for sampling during the current air investigation being conducted by EPA.

EPA Clarification: The Feasibility Study includes the installation of four gas monitoring wells between the landfill and Riverside Gardens. In addition, one well will also be located on Putman Avenue.

53.0 "What follow-up drilling will be conducted on-site to determine actual depth of stored waste?"

EPA Response: At this point in the investigation, there is no follow-up drilling planned on-site. The actual depth of the stored waste will be a major factor only if excavation is chosen as an alternative. Due to the health risks associated with drilling through the fill it is not being considered at this time. resources.

54.0 "EPA tested for chemicals in these homes; they failed to test for methane. We would like to know why this happened. If we are sitting on top of methane, then our homes ought to be tested for it."

EPA Response: The combustible gas unit will be utilized in the future air investigations. In the January '86 air sampling investigation homes were tested for methane using the combustible gas unit. Methane was not detected in any of the homes.

I should also emphasize that methane is an asphyxiant gas, not one of the hazardous substances that are addressed by EPA. Therefore, EPA has focused primarily on the toxic gases that may be mixed with the methane gas.

55.0 "I am wondering why Hofgesang can't be made responsible for landfill."

EPA Response: The Hofgesang Foundation has been named as one of the Potentially Responsible Parties. As such, they will be given an opporutunity to participate in the clean-up remedy. If they choose not to participate, the Agency may seek other legal recourses.

56.0 "Should a burner be installed in the gas collection and venting system?"

EPA Response: At this point into the project we can not make a determination on whether a burner is needed. After sufficient air data is collected and reviewed, EPA will evaluate the need for a gas collection system burner. However, for cost purposes in the FS, a burner was included in the remedial alternatives.

57.0 "The once per quarter monitoring proposed in this and all alternatives is totally inadequate."

EPA Response. The decision to monitor quarterly was based on the following factors: (1) the number of receptors to groundwater, (2) the groundwater flow rate and (3) cost factors. Also, RCRA compliance status requires four quarters of groundwater data to determine baseline groundwater conditions.

TABLE 3

COSTS FOR RURAL WATER DISTRIBUTION

Expansion of Richland RWUA	
Expansion and First Year O&M Costs	$ 305,000
Establish New RWUA	
Construction and First Year O&M Costs	1,985,000
Total Cost to 298 Homes with 1 Year O&M	2,290,000
Plus 1 Year Monitoring	6,000
Total (1 Year)	$2,296,000
Total Cost to 298 Homes with 1 Year O&M	$2,296,000
Additional 9 Years O&M - Richland RWUA	236,000
Additional 9 Years O&M - New RWUA	360,000
Additional 9 Years Monitoring	54,000
Total (10 Years)	$2,940,000

(1) Assumes 278 existing homes with contaminated water and 20 new homes.

TABLE 4

EXISTING RICHLAND RWUA

Costs identified below are for connection of the 90 homes presently within the boundaries.

1. System Connection Fee - Represents individual share of existing common facilities or required upgrading and service line installation including meter, pit and tapping saddle.		
90 homes @ $500/home		$ 45,000
2. 4" dia. mainline extension - Average length assumed to be 1,000 l.f. based on reducing the 1,000 l.f. service line length described in the Feasibility Study to a short stub.		
Material Cost	$1.10	
Installation Cost Using Trencher	1.00	
	$2.10 l.f.	
90 homes - 1,000 l.f. x 2.10/l.f.		189,000
3. Disconnection of plumbing from existing system and connection to new system (4 hrs x $20/hr per home)		
90 homes x $80/home		8,000
4. Replacement of water heater if contaminated with arsenic		
90 homes @ $150/home		14,000
SUB-TOTAL INITIAL COST		256,000
Cost per unit $2,850/home		
5. Cost for including an additional 5 homes which are not currently experiencing arsenic problems.		
5 homes @ $2,850/home		19,000
6. First year O&M costs based on $26/2,000 gallon/ month minimum plus incremental cost of $1.50/1,000 additional gallons for 6,000 gallons/month		
95 homes x $372/home		35,000
TOTAL INITIAL COST		$305,000
Cost for an additional 9 yrs of O&M costs based on $26/2,000 gallon/month minimum. Includes present worth at 9 percent per annum interest rate and inflation at 5 percent per annum.		
Present worth factor (6.731 x 35,000)		$236,000

TABLE 5

ESTABLISH RWUA TO SERVICE AREAS NOT
INCLUDED IN RICHLAND RWUA

Costs identified below are for connection of 188 homes (278 homes less 90 within Richland RWUA) to a rural water system.

1. Main Distribution System - Est. 100 miles to basically bisect the 11 affected townships.

   Material cost 4" Class 160 psi PVC pressure pipe $0.90/l.f.

   Upgrade to Class 200 psi PVC pressure pipe $0.20/l.f.

   Installation cost assuming using trenching machine along side the main roadway and no bedding installation $1.00 l.f.

   Total Pipe Cost $2.10/l.f.

   100 miles x 5280 $\frac{\text{l.f.}}{\text{mile}}$ x $2.10/l.f. — $1,110,000

2. 4" Gate Valves at average spacing of 1/2 mile

   200 gate valves @ $250/ea installed — 50,000

3. Air and vacuum valves average 1 per 10 miles

   10 air/vacuum valves @ $750/ea installed — 7,500

4. 2 Standpipe Reservoirs @ 30,000 gal/ea. Estimated costs including site preparation, piping, painting $0.75/gallon

   2 x 30,000 gal x $0.75/gallon — 45,000

5. 2 Booster Pump Stations including:

   2 3 Hp booster pumps each station at $1,5000 each including electrical

   4 x $1,500/ea — 6,000

   2 10'x10' Pump Building @ $40/ft including electrical and piping — 8,000

TABLE 5

ESTABLISH RWUA TO SERVICE AREAS NOT
INCLUDED IN RICHLAND RWUA (cont.)

6. 1 deep well 50 to 100 gpm capacity		
188 home @ 3 p/u (people/unit) x 70 gpcd = 40,000 gpd or 30 gpm		
8" well 150 ft deep drilling and casing		3,000
mobilization 1/2 day		500
6" stainless steel screen, 30 ft @ $100/ft		3,000
screen fittings		100
sand pack and development		500
5 Hp submersible pump w/drop 2-1/2" drop pipe and electrical panel		5,500
7. 40,000 gpd iron and manganese treatment system including chlorination @ $0.65/gallon		26,000
8. 50'x50' Backwash Pond 500 yd excavation @ $5/yd plus $1/ft square surface prep		5,000
Lining of pond $1.25/sq ft		3,100
9. Well and treatment building 15'x20' @ $30/ft including piping and electrical		9,000
10. Service line installation - average length assumed to be 1,000 l.f. of 1 1/2" polyethylene service line. 1 1/2" diameter used to reduce head loss on long services.		
Material Cost	$0.65/1.f.	
Installation cost using trencher	$1.00/1.f.	
	$1.65 1.f.	
188 homes x 1000 l.f. x $1.65/1.f.		310,000
11. Water meters, pit, valves, tapping saddle and Pressure Reducing Valve		
188 homes x $350/home		66,000
12. Disconnection of existing plumbing		
188 homes x $80/home		15,000

TABLE 5

ESTABLISH RWUA TO SERVICE AREAS NOT
INCLUDED IN RICHLAND RWUA (conc.)

13. Replace water heater	
188 homes @ $150/home	28,000
CONSTRUCTION COST SUB-TOTAL	$1,700,000
14. Engineering Cost for expanded system estimated @ 10 percent of construction cost	170,000
SUB TOTAL INITIAL SYSTEM COST	$1,870,000
15. Cost for including an additional 15 homes which are not currently experiencing arsenic problems. Unit costs were calculated assuming that additional extensive distribution lines would not have to be constructed.	
$760,000 ÷ 188 homes = $4,000/home 15 homes @ $4,000	60,000
16. First year O&M costs based on actual cost to produce and distribute water including electric power, chlorine, chemicals, repairs and maintenance, est. to be $1.50/1000 gallon	
(188 + 15) homes x 3 p/u x 70 gpd x 365 days/yr x $\frac{\$1.50}{1000 \text{ gallon}}$	23,400
1 full time maintenance man and meter reader	
$30,000/yr w/benefit	30,000
TOTAL INITIAL COST	$1,985,000
Cost for an additional 9 yrs of O&M costs based on $37,000/yr (production and labor cost listed above). Present worth at 9 percent per annum interest and inflation at 5 percent per annum.	
Present Worth (6.75 x 53,400/yr)	$360,000

TABLE 1

POPULATION AT RISK WITHIN THE STUDY AREA[1]

Township	Population at risk per arsenic level (mg/l) 0.05-0.10	0.10-0.20	0.20-0.30	0.30-0.40	>0.40
Richland Co.					
Belford	-	-	-	-	-
Brightwood	-	-	-	-	-
Danton	27	0	3	5	-
Dexter	59	-	-	-	-
Duerr	16	-	-	-	-
Elma	-	-	-	-	-
Grant	140	25	0	6	3
Homestead	23	-	-	-	-
Liberty Grove	110	18	0	2	-
Morgan	36	14	-	-	-
West End	9	-	-	-	-
Wyndmere	34	5	7	-	-
Sargent Co.					
Dunbar	24	-	-	-	-
Hall	-	-	-	-	-
Herma	38	3	-	-	-
Kingston	24	-	-	-	-
Marboe	28	6	-	-	-
Ransom	10	-	-	-	-
Rutland	1	-	-	-	-
Shuman	66	6	-	-	-
Tevaukon	-	-	-	-	-
Weber	-	-	-	-	-
Cities					
Lidgerwood	-	-[2]	-	-	-
Wyndmere	-	-	-	-	-
Rutland	-	-	-	-	-
Totals	645	77	10	13	3

Total population at risk: 748

(1) Based on RI and Health Risk Assessment prepared by North Dakota State Department of Health.

(2) Formerly 971, but nev treatment plant nov provides acceptable water.

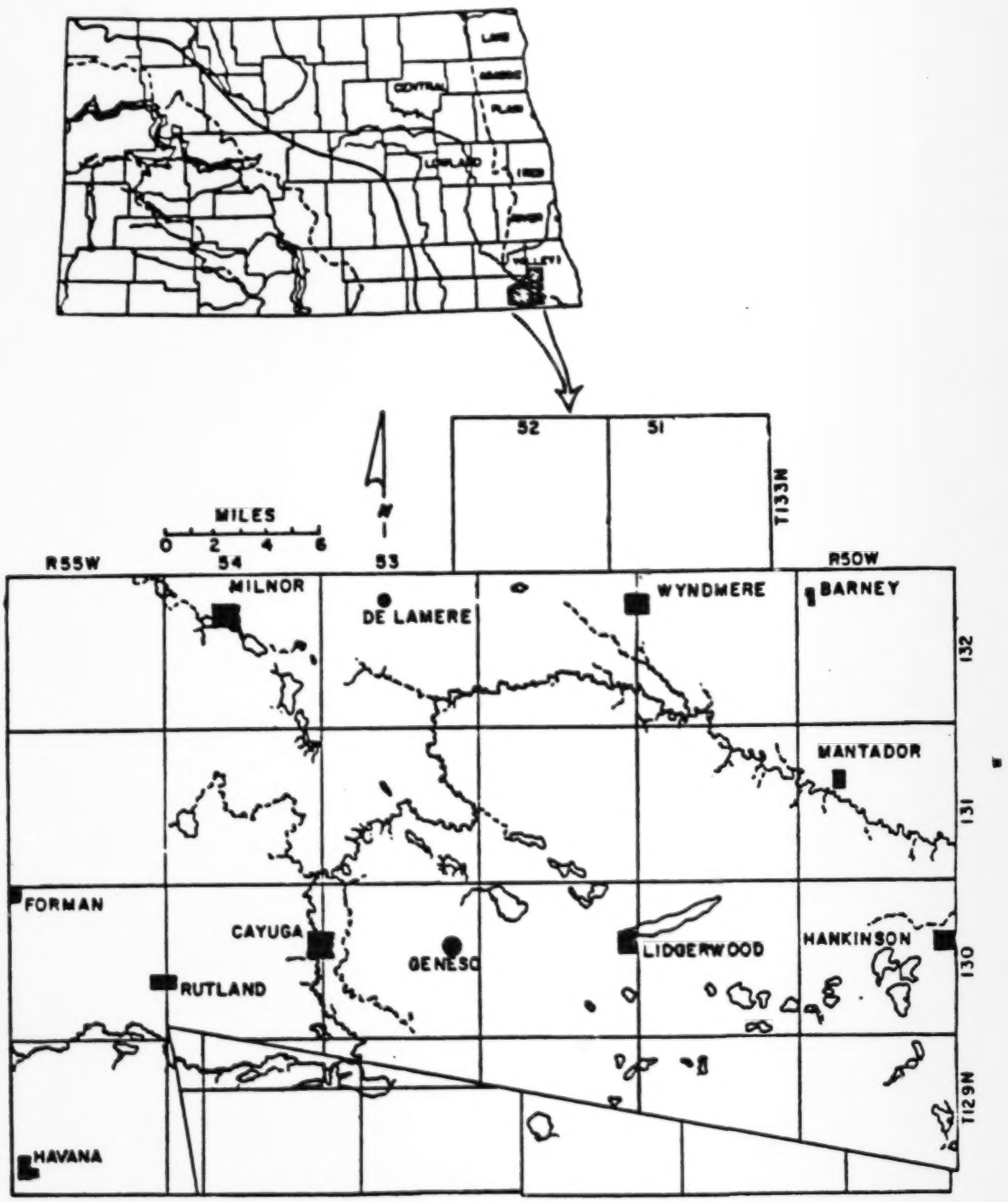
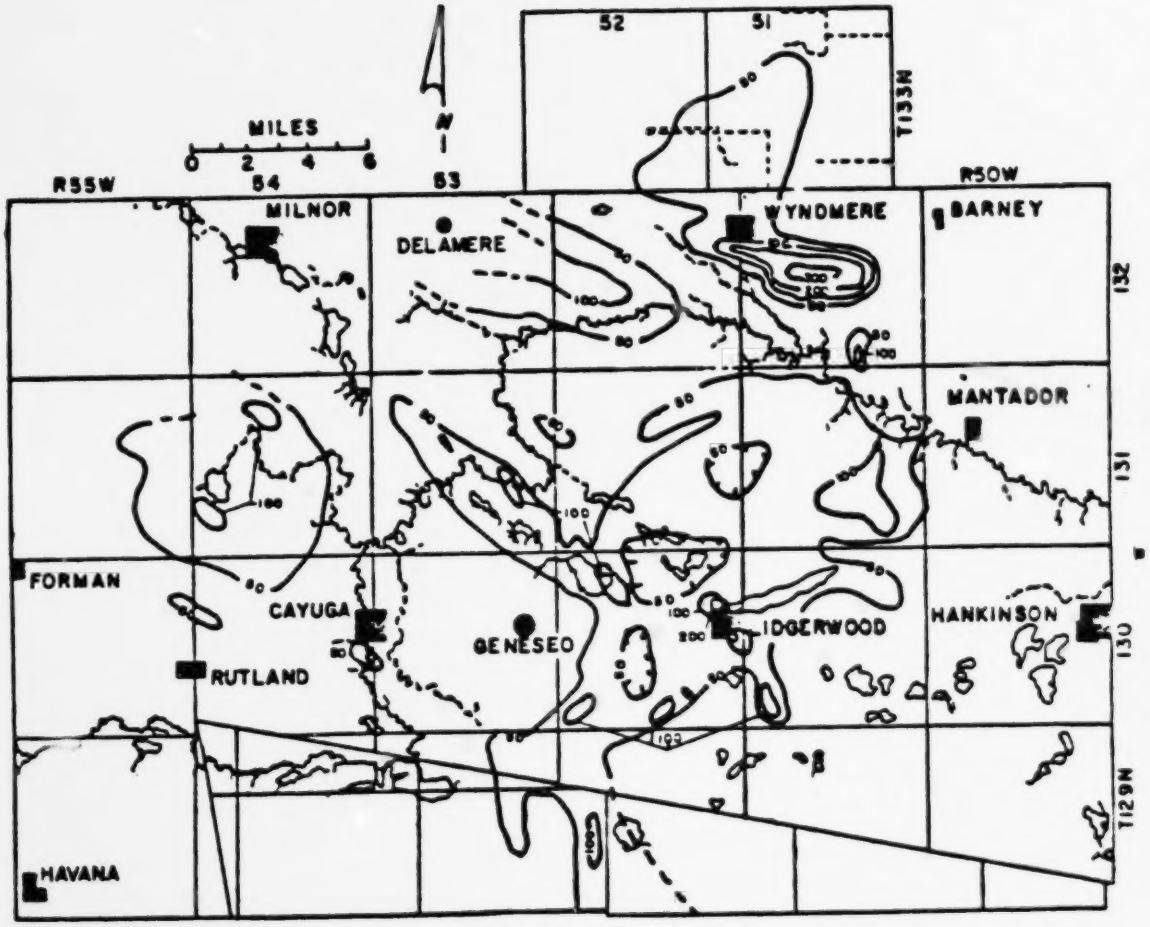


FIGURE 1 PROJECT AREA LOCATION



Contour interval in ug/l.

FIGURE 2 ISOCONCENTRATION MAP OF OBSERVED ARSENIC LEVELS IN GROUND WATER